

AMENDMENTS TO THE CLAIMS

Please cancel claims 30-78 without prejudice.

1. (Original) A method of inhibiting agonist-induced down-regulation of a G protein-coupled receptor, the method comprising contacting cells comprising the G protein-coupled receptor with an effective amount of an inhibitor, wherein:

the G protein-coupled receptor is one that specifically binds to a polypeptide having the amino acid sequence of GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2);

the inhibitor reduces specific binding of the G protein-coupled receptor to said polypeptide; and

an effective amount is an amount sufficient to reduce agonist-induced down-regulation of the G protein-coupled receptor in the cells.

2. (Original) The method of claim 1, wherein the inhibitor comprises a polypeptide that reduces agonist-induced down-regulation of the G protein-coupled receptor and comprises an amino acid sequence that has at least about 70% identity to GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2) over a comparison window of at least 15 contiguous amino acids.

3. (Original) The method of claim 2, wherein the amino acid sequence has at least about 95% identity to GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2) over a comparison window of at least 15 contiguous amino acids.

4. (Original) The method of claim 3, wherein the amino acid sequence comprises an amino acid subsequence of at least about 500 amino acids, of GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2).

5. (Original) The method of claim 2, wherein identity is determined by a sequence alignment performed using BLASTP with default parameters set to measure 70% identity.

6. (Original) The method of claim 2, wherein the amino acid sequence defines a peptide that specifically binds to a G protein-coupled receptor.

7. (Original) The method of claim 6, wherein the peptide comprises a subsequence of at least about 500 amino acids of GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2).

8. (Original) The method of claim 6, wherein the peptide reduces agonist-induced down-regulation of the G protein-coupled receptor.

9. (Original) The method of claim 8, wherein the peptide reduces agonist-induced down-regulation by at least about 20%, as determined by a radioligand binding assay.

10. (Original) The method of claim 2, wherein said contacting comprises administering a composition comprising the polypeptide to the cells.

11. (Original) The method of claim 2, wherein said contacting comprises administering a composition comprising a polynucleotide encoding the polypeptide to the cells, whereby said administration results in the expression of the polypeptide.

12. (**Withdrawn**) The method of claim 1, wherein the cells are *in vitro*.

13. (Original) The method of claim 1, wherein the cells are *in vivo*.

14. (Original) The method of claim 1, wherein the G protein-coupled receptor is selected from the group comprising the delta opioid receptor, the kappa opioid receptor, the D2 dopamine receptor, the D4 dopamine receptor, the beta 2 adrenergic receptor, the NK1 (substance P) receptor, the bradykinin B1 receptor, and US28.

15. (Original) The method of claim 14, wherein G protein-coupled receptor is selected from the group comprising the delta opioid receptor, the kappa opioid receptor, the D2 dopamine receptor, the D4 dopamine receptor, the NK1 (substance P) receptor, the bradykinin B1 receptor, and US28.

16. (Original) The method of claim 15, wherein said contacting is performed by administering a composition comprising the inhibitor to a subject in need of pain reduction.

17. (Original) The method of claim 1, additionally comprising contacting the cells with an agonist of the G protein-coupled receptor in an amount sufficient to stimulate the G protein-coupled receptor.

18. (Original) A method of enhancing agonist-induced down-regulation of a G protein-coupled receptor, the method comprising contacting cells comprising the G protein-coupled receptor with an effective amount of a polypeptide that increases agonist-induced down-regulation of the G protein-coupled receptor, wherein:

the G protein-coupled receptor is one that specifically binds to a polypeptide having the amino acid sequence of GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2);

the polypeptide comprises an amino acid sequence that has at least about 70% identity to GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2) over a comparison window of at least 15 contiguous amino acids; and

an effective amount is an amount sufficient to increase agonist-induced down-regulation of the G protein-coupled receptor in the cells.

19. (Amended) The method of claim 18, wherein the amino acid sequence of the polypeptide that increases agonist-induced down-regulation of the G protein-coupled receptor has at least about 95% identity to GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2) over a comparison window of at least 15 contiguous amino acids.

20. (Original) The method of claim 18, wherein identity is determined by a sequence alignment performed using BLASTP with default parameters set to measure 70% identity.

21. (Amended) The method of claim 18, wherein the amino acid sequence that has at least about 70% identity to GASP SEQ ID NO:2 (GASP1) or GASP SEQ ID NO:6 (GASP2) defines a polypeptide or peptide that specifically binds to a G protein-coupled receptor.

22. (Original) The method of claim 21, wherein the polypeptide or peptide increases agonist-induced down-regulation of the G protein-coupled receptor.

23. (Original) The method of claim 22, wherein the peptide increases agonist-induced down-regulation by at least about 20%, as determined by a radioligand binding assay.

24. (Original) The method of claim 18, wherein said contacting comprises administering a composition comprising the polypeptide to the cells.

25. (Original) The method of claim 18, wherein said contacting comprises administering a composition comprising a polynucleotide encoding the polypeptide to the cells, whereby said administration results in the expression of the polypeptide.

26. **(Withdrawn)** The method of claim 18, wherein the cells are *in vitro*.

27. (Original) The method of claim 18, wherein the cells are *in vivo*.

28. (Original) The method of claim 18, wherein the G protein-coupled receptor is selected from the group comprising the delta opioid receptor, the kappa opioid receptor, the D2 dopamine receptor, the D4 dopamine receptor, the beta 2 adrenergic receptor, the NK1 (substance P) receptor, the bradykinin B1 receptor, and US28.

29. (Original) The method of claim 18, additionally comprising contacting the cells with an agonist of the G protein-coupled receptor in an amount sufficient to stimulate the G protein-coupled receptor.

30-78. **(Canceled)**